

# Rhodora

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## MISCELLANEOUS NOTES ON NEW ENGLAND FERNS AND ALLIES.

GEORGE EDWARD DAVENPORT.

DURING the preparation of the series of Notes here proposed it is the author's intention to jot down from time to time such observations on the character, habits, and habitats of our New England Pteridophytes as may appear to be worthy of special record, and incidentally to ascertain and establish the range of the different species throughout the New England States; also to secure specimens for verification from as many localities as possible to deposit in the Herbarium of the New England Botanical Club as a part of the work on its proposed revision of the New England Flora.

To this end the co-operation of New England fern students is requested, and specimens—especially of unusual forms—with such data as may be necessary for accurate descriptions of plants, and habitats, solicited.

Full credit will be given for all assistance rendered, and the author will gladly reciprocate in every way that he can. Special sendings for identification will be returned to sender on request provided stamps are furnished for return postage, and all specimens may be sent direct to author's address, 67 Fellsway West, Medford, Mass.

I. DEVELOPMENT OF THE SPOROPHYLL IN *OSMUNDA* AND *STRUTHIOPTERIS*.—It is very commonly believed that the fertile fronds, the sporophylls, in *Osmunda* are developed from the centre of the crown, and are surrounded by a circle of sterile fronds, yet careful observation shows that this is an error due to a false appearance of the plant at maturity, and a superficial examination.

Nearly all writers who have mentioned the matter at all have de-



scribed the fertile fronds of *Osmunda cinnamomea* as arising from the centre of a crown the sterile fronds of which surround the fertile in the form of a vase, and Mr. Clute, in his recent very beautiful fern book, has been the first to describe accurately the fact that the fertile fronds arise from the outside part of the series, and that the appearance of the mature plant is due to the angle of ascension through which the growing fronds reverse their natural order.

It is possible, however to infer from Mr. Clute's description that the outer series is wholly composed of fertile, and the inner series of sterile fronds, but this is only partially correct, as, while the fertile fronds always arise from the outside, only a part of the outer series of crosiers develops sporophylls the number varying with the size of the plant; so that the outer series is most accurately described as consisting of both fertile and sterile fronds, while the inner series is always composed of sterile fronds.

Perhaps this may be a little more clearly stated by saying that in the development of the growing plant from the crosiers the sterile fronds lean out at an angle that gradually brings the more erect fertile fronds within the radius of the whole series and thus gives to the mature plant the appearance which has been responsible for a popular error.

This is equally true of the other species of *Osmunda*, both *O. Claytoniana*, and *O. regalis* developing their fertile fronds from the outer row of crosiers, while in *Struthiopteris Germanica* exactly the converse is true the fertile fronds being evolved from within the centre of the vase-like series of sterile fronds.

2. NEW STATIONS FOR *ASPLENIUM EBENEUM*, Aiton, var. *HORTONAE*, Davenport. — This very lovely fern which was described in *RHODORA* for January (1901) as a "plumose" variety of the ebony spleenwort from Vermont, appears to have been found as long ago as 1894, by Prof. C. E. Waters at a station on the Gunpowder river near Baltimore, Maryland. Prof. Waters at the time noticed the peculiar cutting of the frond, and made a blue print impression which is now in my possession, and which shows clearly enough the identity of his plant. Recently he has written me that he has seen a single frond of the variety in the Herbarium at Mt. Holyoke without data, but this I cannot personally vouch for.

Another specimen which, through the courtesy of Mrs. Horton, I have seen, was collected by Mr. J. H. Ferriss on Carrion Crow Mt.,

Arkansas, in March (1901). This specimen appears to be much less cut than a careful examination shows it really to be, the deep oblique incisions being very fine and close, but I have not hesitated to refer it to the variety as all of its other characters are those of var. *Hortoniae*.

There is really nothing surprising in the finding of this form at stations so far apart, as, given plenty of *A. ebeneum*, and spore dissemination for factors, there is no reason why similar variations should not follow spore germination wherever the species abounds.

It is not to be expected that in all cases the result should be mechanically identical, as if made by dies, but considerable divergence is to be looked for. In my own plants, now under cultivation, some of the fronds are beautifully frilled, and feather like in appearance, the incisions being very deep, with the oblique lobes crowded closely together and overlapping one another in a more or less imbricated manner, while the rachises are somewhat flexuose and the lamina gracefully curved. dies

In some more highly developed fronds from Mrs. Horton the incisions are more open, and some of the pinnae are conspicuously pinnatifid to the centre with the lobes strongly incised, and the halbert-shaped basal ones broadly and deeply pinnatifid, so that the frond is bipinnatifid.

Mrs. Horton notices that in the taller fronds the stalks just above the base are exceedingly brittle, and break off easily much after the manner of the *Woodsias*.

So far this variety has shown no signs of fruiting and is to be regarded as a sterile form, bearing a somewhat similar relation to the normal form of the species as var. *cambricum* does to *Polypodium vulgare*.

MEDFORD, MASSACHUSETTS.

BOLETI COLLECTED AT ALSTEAD, NEW HAMPSHIRE,—  
ADDITIONAL NOTES.

H. WEBSTER.

As no small part of the interest and profit of studying the fleshy fungi in the field is connected with observing the recurrence or the non-appearance of the fruiting stage in succeeding years, it may be worth while to compare the list of Boleti seen at Alstead, New Hampshire, a year ago<sup>1</sup> with this year's list. Whether owing to greater rainfall, greater heat, or to some less obvious difference in the conditions, the Boletus season was a week or ten days earlier, apparently, than in 1900. On the other hand, in general, Boleti did not fruit so freely, in spite of a rather marked increase in the abundance of a few kinds such as *B. felleus* and *B. bicolor*. By the first of August, all the species collected a year ago had again been seen, and a few days later, when collecting ceased, a glance at the list showed several kinds not seen last year, as well as one or two seen too late to be noted at the time.

Noteworthy for its plentifulness in certain localities, usually hemlock or mixed woods, was *B. albus* Peck. Closer acquaintance with this species brings out its individuality, more strikingly, as well as deepening the conviction that somehow it must be *B. granulatus* in disguise. Its proportions are, on the whole, constantly different, taking the average of many collections. It has longer stems, with smaller caps, than its close relative. Moreover, the color of the granules that stud the white stems is darker, with a purplish, or pale inky tint, foreign to *B. granulatus*. Both species in the young button stage are often covered underneath with drops of moisture, in which some of the coloring matter seems to be suspended.

*Boletus piperatus* was conspicuous by its rarity. Usually the roadsides and certain spots in deciduous woods are dotted with it. *B. subglabripes*, also, surprisingly plentiful last year, was comparatively scarce. On the other hand *B. bicolor* was frequently found, perhaps in places overlooked in previous years. It is certainly very constant to locality. *B. chrysenteron*, too, was this year familiar in the collecting baskets—not only in the typical form, but also in the dimin-

<sup>1</sup> See RHODORA 2: 20. August, 1900, p. 173.



utive, rose-pink state which seems invariable enough for varietal distinction at least, and is possibly the form that Masee considers equivalent to *B. versicolor* Rost.

*B. pachypus* was found so often as to seem common. In appearance it agreed well with Fries's plate [Ätl. och Gift. Sv. Pl. LXVIII], though more subdued in tint, as might be expected. No specimens were found with swollen stems. A disagreeable bitterish taste was always present. The spores, as in Gillet's figure, are of the usual *Boletus* type. Of *B. griseus* several collections were made, looking, as usual, much like bleached and darkened *B. ornatipes*, but almost invariably much heavier, and with much thicker stems. The specimens with yellowish stems are especially calculated to raise doubts.

*B. affinis* Peck was very abundant in mixed woods. It varied much in the intensity of the brown of the cap, and passed easily into the var. *maculosus* Peck with spotted top. The dark ferruginous stains of the bruised pores, and the bright ochraceous color of the old pore surface were very constant. Some specimens showed the upturned margins and convex tube surface noted by Mr. Peck.

*B. luridus* was extraordinarily abundant. Occasionally it had the dark intense colors of the descriptions and plates, but was usually paler, and soon faded to dingy orange. Few colors are more striking among fungi, than the rich red or purple of the young pore surface of this *Boletus*.

*B. gracilis* Peck was occasional. It is like a slender delicate form of *B. scaber* with pores the color of those of mature *B. felleus*. It was found here and there one, always unexpectedly.

Of species unrecorded last year, the most interesting for its beauty and apparent rarity is *Boletus Ravenelii*. This was found first late in July, growing sparingly among ferns on the raised border of a sphagnum bog in Langdon, a little north of the Cheshire county line. A few days later another collection was made on a rocky hillside in mixed woods in Alstead. The fruits in both cases were not fully developed, but all the more beautiful for that reason, for the veils were unbroken. The bright sulphur yellow of the buttons makes them striking objects, especially in a green setting. Of somewhat less interest is *B. variipes* Peck. A small collection of this, part of which was seen by Mr. Peck, was made in 1900 and more was found this year. It is not a striking species. Another addition to the list is *Strobilomyces strobilaceus*, which was found too late

for mention last year. This year it was conspicuous in early August in various places.

The thirty-three species of Boleti so far seen at Alstead, besides a few forms not yet satisfactorily placed, are to be found fruiting almost at the same time. In fact, a year ago, twenty-five species were assembled in one day's collecting. As the localities where each kind may be expected with certainty become better known, it may well be possible in a good season to bring all the July and August species together in a fresh state.

### NEW STATIONS FOR JUNCUS SUBTILIS.

M. L. FERNALD.

IN September, 1897, a very slender strongly proliferous *Juncus* was found in abundance in shallow water of Mattawamkeag Lake, Aroostook County, Maine. Except for its nodulose leaves and crimson color the plant resembled the well-known floating state of *Eleocharis acicularis*; and as is usually the case with the submersed *Eleocharis* the *Juncus* was entirely sterile. Subsequently the plant was collected in pools by the St. John River at Van Buren, but at this station only sterile specimens were seen.

On the tenth of August last (1901) the same slender floating form of the plant was found in a quiet pool or "bogan" of the St. John River at Fort Kent, Maine. All the submersed plants were sterile, but those which had become stranded upon the muddy shore showed a tendency to flower. These stranded individuals were strongly repent; and they so closely resembled the matted plants of *Ranunculus Flammula*, var. *reptans*, with which they grew, that only the most back-breaking and eye-straining scrutiny would reveal them. The combined search of Mr. E. F. Williams, Dr. B. L. Robinson and the writer during a large part of the afternoon and much of the next forenoon was rewarded by perhaps sixty fertile plants. Of these, however, only a small proportion were yet in flower, and none were in fruit.

A comparison of the flowering material collected at Fort Kent shows it to be identical with the plant found in 1871 by the late Charles E. Smith at the margin of Brassua Lake, Somerset County,



Maine. Mr. Smith's plant has been referred to *Juncus subtilis*, E. Meyer, although by recent authors that obscure species has been treated merely as an aquatic variety of *J. pelocarpus*.

According to Meyer, his plant, collected by Bosc "in uliginosis et rivulis Canadae," was the same as that referred by Michaux to Lamarck's *Juncus fluitans*. The brief description given by Meyer, "Caule radicante folisque capillaceis, floribus subbinis, perianthii laciniis obtusis, interioribus longioribus, (staminibus tribus?)," agrees with the capillary plant found at various points in northern Maine, except that in the Fort Kent material there are usually 6 (rarely 4) stamens. Engelmann's description of *J. pelocarpus*, var. *subtilis*, drawn from Michaux's *J. fluitans* (collected at Chicoutimi, Quebec), "caule reptante vel fluitante radicante folioso: foliis brevibus setaceis ex axillis proliferis; floribus subbinis 3-andris," agrees with the Maine plant quite as well as does Meyer's characterization.

*Juncus subtilis* has been very little known since its original description by Michaux (as *J. fluitans*) and by Meyer. In American herbaria it has been known only recently, from Mr. Smith's Brassua Lake material, in most of which the stamens are badly shrivelled or wanting. Owing to this insufficient knowledge of the flower the plant has long been treated as a floating state of *J. pelocarpus*. When Dr. Engelmann first suggested this disposition of the delicate plant it was with hesitation, for the species was then unknown to American botanists and his only acquaintance with it was from Laharpe's notes on the Michaux material.

At Mattawamkeag Lake and at Fort Kent where *Juncus pelocarpus* is abundant both on the shores and in shallow water no tendency to intergrade with *J. subtilis* has been noted. *J. pelocarpus* in water, as well as on shores, is an erect plant with definite caudex, with usually two or three ascending long leaves, and with a well developed dichotomous panicle. The flowers are often modified into tufts of small leaves, but this proliferous tendency is strictly confined to the inflorescence. In perfect flowers the sepals (or at least the alternate ones) are acuminate, and the anthers are distinctly longer than the filaments. *J. subtilis*, on the other hand, is a capillary repent plant, in water often becoming 2 dm. long. The roots are slender and fibrous but no definite caudex is apparent. The setaceous basal leaves are very numerous and elongated, while the axils of most of

the cauline bear fascicles of shorter leaves. The flowers are solitary or few (mostly in pairs) on short lateral or terminal branches; the sepals are obtuse; and the anthers are distinctly shorter than the filaments. With such marked vegetative and floral characters *J. subtilis* seems clearly distinct from *J. pelocarpus* with which it has recently been associated.

Its bibliography and stations are:

*JUNCUS SUBTILIS*, E. Meyer, Syn. Luz. 31; Laharpe, Mon. 135. *J. fluitans*, Michaux, Fl. i. 191, not Lam. *J. verticillatus*, Pursh, Fl. i. 237, in part, not Pers. *J. uliginosus*, var. *subtilis*, Hook. Fl. Bor.-Am. ii. 191. *J. pelocarpus*, var. *subtilis*, Engelm. Trans. St. Louis Acad. ii. 456; Gray, Man. Ed. 5, 541; Coville in Britton & Brown, Ill. Fl. i. 390. *J. pelocarpus*, var. *fluitans*, Buchenau, Mon. 283. — QUEBEC, Chicoutimi (*F. A. Michaux*, according to Prof. Ovide Brunet): CANADA, without station (*Bosc*, according to Meyer): NEWFOUNDLAND, mud near Bay St. George, Aug. 25, 1897 (*A. C. Waghorne*): MAINE, margin of Brassua Lake, Somerset County, 1871 (*Chas. E. Smith*); Mattawamkeag Lake, Sept. 7, 1897, and margin of St. John River, Van Buren, Sept. 18, 1900 (*M. L. Fernald*); margin of St. John River, Fort Kent, Aug. 10, 1901 (*E. F. Williams*, *B. L. Robinson*, & *M. L. Fernald*).

*Juncus fluitans*, Lam., for which Michaux mistook his Chicoutimi plant is a form of *J. bulbosus*, L. (*J. supinus*, Moench) and is to be expected in northern New England and adjacent Canada. This plant, which has been collected in Newfoundland by Robinson and von Schrenk, differs from *J. subtilis* in its coarser habit, usually bulbous-thickened base, several-flowered heads and more pointed sepals.

GRAY HERBARIUM.

## LATHYRUS TUBEROSUS IN VERMONT.

L. R. JONES.

SPECIMENS of an unusual and very pretty sweet pea, *Lathyrus tuberosus*, L., were recently sent to me from Vergennes, Vermont, by Miss Ruth Fisher. This species is a native of Asia and eastern Europe. It occurs also at a single station in England according to



Hooker, but so far as I can learn it has not heretofore been reported from America. This seems strange for the flowers are almost equal in color and fragrance to those of the common sweet pea although only two-thirds as large. *L. tuberosus* is a perennial with creeping root-stocks bearing numerous tubers or tuberous roots. These have an agreeable flavor, suggestive of green peas, and are reputed edible. It is not only perfectly hardy in Vermont but is abundantly able to persist as a weed. Miss Fisher has watched its development and spread in a moist meadow during some ten years. At first only a few plants occurred, but now it is scattered over a number of acres and for a distance of forty rods. The land has been under cultivation with corn and potato crops during a part of this period and the persistent spreading of the species under these conditions has finally alarmed the owner of the field. It forms dense circular patches resembling *Vicia Cracca* in habit and like that species it smothers the grasses and clovers in the area where it occurs.

Its mode of introduction is a mystery. The location precludes the idea that it is a garden escape. Some horses were brought to this farm from France fifteen or more years ago and possibly it was introduced at that time. I recently showed the plant to Mr. F. H. Horsford of Charlotte and he at once recognized it as the same plant that seedsmen have sent to him under the name *Lathyrus rotundifolius*. The identification of the plant as *L. tuberosus* has, however, been confirmed at the National Herbarium. Mr. Horsford has had the plant in his nursery at Charlotte for some time but he has recently omitted it from his catalogues partly because he considered it too likely to become a weed pest. I am confident that the plant is in Vermont to stay unless unusual efforts are made to eradicate it. Since it has been distributed somewhat by seedsmen it probably occurs in other places in this country as a garden escape.

UNIVERSITY OF VERMONT.

NOTES ON SOME TREES AND SHRUBS OF WESTERN  
CHESHIRE COUNTY, NEW HAMPSHIRE.

M. L. FERNALD.

THE past three summers have afforded an opportunity to study the vegetation of a portion of southwestern New Hampshire drained by the Connecticut River and its tributaries, the Ashuelot and the Cold Rivers. The principal observations have been made in the course of short walking or longer driving excursions within a radius of about ten miles from Alstead Centre. Here have been noted very many species quite unfamiliar to one whose knowledge of the New Hampshire flora is confined to the White Mountains, the dry upland of eastern Cheshire County, or the coastal area. The forests of western Cheshire County are essentially deciduous, though occasional spruce or fir swamps occur and white and pitch pine are found in their proper habitats. In the main, however, the forests are composed of southern rather than northern trees; and several species which rarely reach eastern or central New Hampshire are here conspicuous elements in the landscape.

In the following notes are recorded such trees and shrubs of this region as seem to the writer of sufficiently restricted range in New England to be of special interest. Note is also made of a few species generally common throughout eastern New England but apparently wanting or very rare in the southwestern corner of New Hampshire.

*Pinus resinosa*, Ait. Very rare and scattered.

*P. rigida*, Mill. Abundant on the Drewsville sand-plain and on the lower slopes of Fall Mt., Walpole. Scattered individuals reach an altitude of 340 m. (1100 ft.) at Alstead Centre.

*Larix americana*, Michx. Only cultivated specimens noted in the region.

*Picea rubra*, Link. The only spruce seen. Scattered in upland woods and occasionally forming forests.

*Abies balsamea*, Mill. Often planted, but native only in upland woods and swamps at about 460 m. (1500 ft.) alt., near Gustin Pond, Marlow.

*Thuja occidentalis*, L. Only cultivated specimens seen.

*Juniperus communis*, L., var. *canadensis*, Loud. Very rare. One small station noted on a hillside near Keene.



*J. virginiana*, L. Dwarf trees at scattered stations in Alstead.

*Juglans cinerea*, L. Very common in rich soil.

*Carya amara*, Nutt. Frequent, especially by streams.

*C. alba*, Nutt. Frequent in upland woods; ascending to 370 m. (1200 ft.) at Alstead Centre.

*Populus balsamifera*, L., var. *candicans*, Gray. One of the commonest and stateliest trees in the alluvium of the Connecticut and the Cold River. With Negundo, River Maple, and White and Slippery Elm, forming a tall and dense forest along the Connecticut at the foot of Fall Mt., and opposite Bellow's Falls. The densely pubescent petioles and the ciliate margins of the broad-cordate leaves at once distinguish this tree from the usually smaller but more common *P. balsamifera*.

*Salix longifolia*, Muhl. Small shrubs by the Connecticut, below Fall Mt., Walpole.

*Betula populifolia*, Marsh. Rare: occasional scattered trees in dry soil.

*Castanea sativa*, Mill., var. *americana*, Gray. Frequent, especially in upland woods.

*Quercus rubra*, L. The common oak of the upland woods.

*Q. velutina*, Lam. (*Q. tinctoria*, Bartram). Frequent in sandy soil, Drewsville.

*Q. ilicifolia*, Wang. Common on the Drewsville sand-plain and at the base of Fall Mt., Walpole.

*Q. alba*, L. The common oak of the sand-plains and of dry woods, especially below 250 m. (800 ft.) altitude.

*Q. prinoides*, Willd. Fruiting shrubs 1 m. high abundant on the crest of Fall Mt., Walpole.

*Ulmus fulva*, Michx. Scattered trees with the more abundant *U. americana* in alluvium of the Connecticut River.

*Sassafras officinale*, Nees. Small trees on the eastern slope of Fall Mt., Walpole.

*Ribes Cynosbati*, L. Very abundant in damp gravelly or rocky soil.

*R. oxyacanthoides*, L. The smooth-fruited gooseberry so common throughout eastern New England has been searched for in vain, and it appears to be quite unknown to the people of the region.

*Platanus occidentalis*, L. Frequent by streams.

*Rubus neglectus*, Peck. Frequent in damp thickets, Alstead and Walpole. Resembling *R. occidentalis*, but with purplish-red raspberry-like fruit.

*R. nigrobaccus*, Bailey, var. **calycosus**. Calyx composed of veiny laciniate or toothed leaf-like sepals 2 to 6 cm. long: lower pedicels usually elongated: fruit 0.5 to 1 cm. long, dry. Covering several square rods in a dry thicket, Alstead Centre, Aug. 7, 1899 (*M. L. Fernald* in *Herb. Alstead School Nat. Hist.*, no. 21); July 28, 1901 (*E. F. Williams*). First called to the writer's attention by Miss Alice Mallonee. Apparently identical specimens are in the Gray Herbarium from Caldwell, New Jersey, 1879 (*M. S. Crane*), and from Wyathville, Virginia (*H. Shriver*).

*Rosa blanda*, Ait. Rare in alluvium by the Connecticut, Westmoreland.

*R. carolina*, L. Infrequent, margin of Warren Pond, Alstead.

*R. humilis*, Marsh. Abundant on the Drewsville sand-plain and on the west slope of Fall Mt., Walpole.

*R. lucida*, Ehrh. This, the common rose of eastern New England, is apparently unknown in southwestern New Hampshire. Only one station, in the Hoosac valley, is recorded in Vermont.

*R. nitida*, Willd. This species, as yet unrecorded in Vermont, has been noted about various ponds and in boggy meadows in Alstead and Marlow, only a few miles from the Vermont border.

*Prunus americana*, Marsh. One clump of small trees in a thicket at Alstead Centre has the characteristic spherical fruit of this species. *P. nigra*, Ait., with oblong laterally flattened fruit is abundant.

*P. insititia*, L. Well established in a roadside thicket, Surry.

*P. pumila*, L. Very abundant in sand and gravel by the Connecticut. The fruit, mature in late July, has been used successfully in making a rich dark jelly.

*Xanthoxylum americanum*, Mill. Locally abundant on the gravelly slope of Surry Mt., Surry: also at scattered stations in Alstead.

*Rhus copallina*, L. Common in dry soil in the Connecticut valley; ascending to 280 m. (900 ft.) near Alstead Centre.

*R. glabra*, L. Drewsville sand-plain and slopes of Fall Mt., Walpole.

*Acer saccharum* Marsh., var. *barbatum*, Trelease. Characteristic trees with small firm dark green three-lobed leaves appear very distinct, but many transitions are noted between this and the typical *A. saccharum*.

*A. saccharum*, var. *nigrum*, Britton. Occasional in alluvium of



the Cold River. The large dark green "flabby" leaves with closed sinuses and with densely pubescent petioles and lower surfaces quickly distinguish this tree from the ordinary forms of the sugar maple.

*A. saccharinum*, L. (*A. dasycarpum*, Ehrh.). The common maple of alluvium by the Connecticut and the lower Cold River.

*A. Negundo*, L. Frequent in alluvium by the Connecticut.

*Ceanothus americanus*, L. Abundant on dry banks of the Connecticut, on Fall Mt. and the Drewsville sand-plain.

*Vitis Labrusca*, L. Occasional on dry banks.

*V. aestivalis*, Michx. Rocky slope of Fall Mt., Walpole.

*V. vulpina*, L. (*V. riparia*, Michx.) Abundant by rivers. Climbing high (often forty feet) and forming dense arbors by the Connecticut.

*Dirca palustris*, L. Very local: one small bush in rich woods below Alstead Village.

*Nyssa sylvatica*, Marsh. Small fruiting trees in gravel by the Connecticut, base of Fall Mt., Walpole.

*Rhododendron cænescens*, Don. Common on Fall Mt., and on gravelly banks of the Connecticut.

*R. Rhodora*, Don. Apparently rare or unknown in the region, although abundant on Mt. Monadnock a few miles distant.

*Kalmia latifolia*, L. Forming an extensive thicket by the Ashuelot River, Gilsum.

*Andromeda ligustrina*, Muhl. Frequent in damp gravelly soil below 308 m. (1000 ft.) altitude.

*Gaylussacia resinosa*, Torr. & Gray, var. *glaucoarpa*, Robinson. With the species, gravelly banks of the Connecticut, Walpole.

*Vaccinium corymbosum*, L., var. *atroccum*, Gray. Abundant with the species, Warren Pond, Alstead.

*V. vacillans*, Kalm. Abundant in dry soil, Drewsville sand-plain, slopes of Fall Mt., and other sections of Walpole.

*Fraxinus pennsylvanica*, Marsh. (*F. pubescens*, Lam.). Gravelly shore of the Connecticut, Walpole.

*F. pennsylvanica*, var. *lanceolata*, Sargent (*F. viridis*, Michx.). With the species.

*F. nigra*, Marsh. Valley of the Cold River, Alstead and Marlow. Rare below 400 m. (1300 ft.) altitude.

*Lonicera dioica*, L. (*L. glauca*, Hill). Frequent either as a climbing

vine or a sprawling shrub, Drewsville sand-plain, Fall Mt., and at other sections of Walpole.

ALSTEAD SCHOOL OF NATURAL HISTORY, Alstead, New Hampshire.

## NOTES ON THE FERNS OF MARANOCOOK, MAINE.

HAVEN METCALF.

I find upon consulting my notes and herbarium, made during some years of residence in Winthrop, Maine, that I can supplement Mr. Davenport's list in RHODORA, i. 218, as follows. All the plants named, except where noted, grow within two miles of the Maranocook station.

*Aspidium fragrans* Swartz. Scarce; along a brook on the east shore opposite Craig's Point. Also on the northern slope of Mt. Pisgah, five miles southwest of Maranocook.

*Aspidium Goldianum* Hook. Fairly common in woods on north and east shore of the lake.

*Asplenium ebeneum* Ait. In one locality, near Kent's Hill.

*Asplenium thelypteroides* Michx. In several localities near the shores of Lake Anabescook.

*Asplenium Trichomanes* L. Along the steep banks of a gully, toward Kent's Hill.

*Camptosorus rhizophyllus* Link. In one locality only, growing over a ledge, near Kent's Hill. When I last visited the place, in 1894, the plants were being decimated by local amateur collectors.

*Cystopteris fragilis* Bernh. Common in upland woods throughout the region.

*Polypodium vulgare* L. Common; hills west of the lake.

*Woodsia ilvensis* R. Brown. Fairly common along high land east of lake, about ledges.

*Woodsia obtusa* Torr. Several localities about Mt. Pisgah.

*Woodwardia virginica* Smith. Abundant in the swamp along the Readfield shore, also in the swamps east of Mt. Pisgah.

Twelve years ago *Adiantum pedatum* was very common all about this region; but the plant has been so much sought after by summer visitors that it is practically extinct in all accessible localities. It is



still abundant along the borders of the deep swamps east of Maranocook.

Mr. Davenport's paper and this give some idea how rich the region is in ferns. I might mention further, that *Isoëtes* is common about the shores; and in a brook running into the arm of the lake east of the Maranocook station *Marsilia quadrifolia* can be found. I have an idea that the latter is a newcomer, as I never saw it in this place until 1896, and it has become more abundant each year since. I wish that members of the New England Botanical Club might be induced to botanize further about Lake Maranocook.

TABOR COLLEGE, Tabor, Iowa.

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HABENARIA HOOKERIANA OBLONGIFOLIA IN WEST CAMPTON, NEW HAMPSHIRE. — *Habenaria Hookeriana oblongifolia* ascribed to New York and Canada by Gray's Manual (edition of 1889), has been found in considerable numbers in a patch of woods near the West Campton schoolhouse. Leaves measured about two and one-half inches by five and one-half. Only one specimen was found in flower. — PHILLIPS BARRY.

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LYCOPodium CLAVATUM, VAR. MONOSTACHYON IN NORTHERN MAINE. — The typical form of *Lycopodium clavatum*, L., has two or more spikes upon each peduncle. The number varies somewhat without changing the habit of the plant. The case, however, in which the two spikes are regularly replaced by a single one gives rise to a rather striking form or variety, which is the better marked from the fact that the single spikes are of greater size than those which compose the pairs in the typical form. The single-spiked variety was briefly characterized by Hooker (Fl. Bor.-Am. ii. 267) from the Rocky Mountains of British America, as var. *monostachyon*, but has been little known and usually omitted from general treatments of the American Pteridophytes. However, Prof. J. M. Macoun in his Catalogue of Canadian Plants, v. 290, records the variety from Little Tobique Lake, New Brunswick (*G. U. Hay*), Prince Edward's Island (*J. Macoun*), and Blood-vein River, Lake Winnipeg (*J. M. Macoun*). The first station for the variety in the United States was reported by Mr. M. L. Fernald last June (RHODORA, iii. 169) on the basis of the

collections secured on Mt. Katahdin by himself and others of the party of New England botanists who visited that mountain in July, 1900. In July, 1901, Mr. Fernald again found this one-spiked variety at Alstead, New Hampshire.

During a recent excursion to northern Maine, Mr. E. F. Williams, Mr. Fernald, and the writer had many opportunities to observe the frequency, abundance, and marked character of the variety in northern Aroostook County from Ashland to Fort Kent and also at Grand Falls, New Brunswick. In most places where it was observed it was growing near the typical form, but at Fort Kent it had become the prevailing variety, the typical form being relatively infrequent.

It was noted that two-spiked peduncles occasionally occur upon var. *monostachyon*, but always as the last formed ones of the season's growth. It is a well-known fact that in the feebleness of growth near the end of its growing season reversionary traits are likely to appear. Thus the occasional occurrence of two-spiked peduncles at this late stage in the annual development of var. *monostachyon* does much to confirm the theory that the one-spiked variety has, as in its classification we assume, developed from a recent two-spiked ancestor.—B. L. ROBINSON, Gray Herbarium.

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THE "AMERICAN FERN BOOK," or "OUR FERNS IN THEIR HAUNTS," by WILLARD NELSON CLUTE, with illustrations by WILLIAM WALWORTH STILSON.<sup>1</sup>—The impetus which has been given to fern study in this country by the Linnaean Fern Chapter and the Fern Bulletin has opened a wide field for fern literature. Hitherto this field has been occupied only by John Williamson's pioneer *Ferns of Kentucky*, and *Fern Etchings*, John Robinson's *Ferns in their Homes and Ours*, Prof. Daniel C. Eaton's classical *Ferns of North America*, in two large volumes, Dr. Underwood's valuable "Manual," and Raynal Dodge's praiseworthy volume on the *New England Ferns and their Allies*.

However, in all these works, unless it be Prof. Robinson's and *Fern Etchings*, the treatment has been more or less technical, while several minor publications—not readily available for general use—have partaken more of the character of descriptive catalogues or out-

<sup>1</sup>Frederick A. Stokes Co., New York.

line lists. It has thus happened that the first really popular work published in this country on ferns, has been Mrs. Parsons' admirable book in which the subject has been treated in an exceedingly pleasing manner. Admirable and valuable as these works have been there has still been wanting some treatise, which, combining the excellent points of the others, should treat ferns in a more comprehensible and popular manner and still keep in touch with the most advanced knowledge of the subject. This want is well met by Mr. Clute's beautiful book.

The author has long been favorably known as one of the best of our fern students, and his identification with the "Fern Bulletin" as its editor, has fitted him admirably for the task of popularizing the really scientific features of fern study and presenting the result in a most attractive manner.

The whole appearance of the book is in its favor, and it is to be warmly commended to fern lovers as the very best book of its kind yet published.

In his treatment of the vexed subject of nomenclature the author has wisely adopted a conservative course, and, for the most part retained the long established familiar names as maintained at Cambridge, and by the best authorities in this country and abroad.

The book is beautifully and profusely illustrated, many of the plates showing the ferns as they grow in nature, and suggesting here Heath's charming book on the English Ferns, while the text is replete with sentiment and legendary lore, much after the manner of Anne Pratt's popular Ferns of Great Britain.

The key at the end of the volume, is somewhat original in the simplicity of its treatment and ought to be a great help to beginners in the determination of specimens.

As the scope of the book practically coincides with the range of Gray's Manual, it covers well our New England Ferns and no New England fern student can afford to be without a copy. — GEORGE E. DAVENPORT, Medford, Mass.

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SELF-STRANGULATION IN THE VIRGINIA CREEPER.—About the middle of last June Mrs. J. H. Robinson called my attention to the peculiar fate of a Virginia Creeper (*Ampelopsis quinquefolia*, Michx.) which had been growing beside her cottage at Jaffrey, New Hampshire.



One of the tendrils of the main stem failing to find other support had, as it appears, wound itself around a higher internode upon the same shoot and, after making one complete revolution had turned sharply around enclosing itself in a loop and then encircled the stem in the opposite direction. The knot-like loop, thus formed, was evidently so tight that further enlargement of the stem at this point was stopped. Growth of the adjacent parts, however, continued both above and below giving rise to a deep constriction in which the tendril was buried. This must have occurred during the growing season of 1900. In the spring of 1901 the part of the stem below the tendril put out leaves as usual, but the part above failed to develop its foliage and although still slightly green beneath the outer cortex showed unmistakable signs of death and decay. An examination of several other plants of Virginia Creeper indicates that the tendrils not rarely attach themselves to the stem that bears them but without injuring it. In the case particularly described the suicidal result was doubtless due to an unusually tight knot formed by the tendril. The fact that the stem continued to grow above the stricture and only died as winter came on shows the case to be analogous to the death of a shoot by girdling.—B. L. ROBINSON, Gray Herbarium.

## THE HERBARIA OF NEW ENGLAND.

MARY A. DAY.

(Continued from page 222.)

**Frost, Charles Christopher.** — Mr. Frost's herbarium is now stored in the Brook's Library, Brattleboro, Vermont, and is under control of the library authorities. It consists largely of a set of lichens, a set of Lesquereux' mosses (several hundred numbers in the original fascicles), and an unmounted set of fleshy fungi (usually only rough dried) in pasteboard boxes. Most of the labels accompanying the fungi give only the name of the genus and species, but no data regarding the locality, date, or collector. This part of the collection is now in the basement of the library and is not accessible for study. The lichens are in cases in the main library room and can be seen by visitors.

**Fuller, Timothy Otis,** NEEDHAM, MASS. In 1882 Mr. Fuller

began his herbarium of New England plants, and has increased it steadily year by year. He has 552 genera of phaenogams and vascular cryptogams consisting of 1535 species and 55 varieties, mounted on 2900 sheets. Of these species 139 belong to the pteridophytes, 143 to the *Gramineae*, and 142 to the *Cyperaceae*, the genus *Carex* alone containing 96 species. This herbarium is carefully arranged and fully indexed which facilitates botanical work in it.

**Furbish, Kate**, BRUNSWICK, MAINE. — Miss Furbish has a herbarium which represents her collections in the different parts of Maine during the last twenty-five years. It is partly organized and contains many of the plants represented by her paintings of the flora of Maine.

**Graves, Charles Burr**, NEW LONDON, CONNECTICUT. — The herbarium of Dr. Graves represents chiefly the flora of New London, Connecticut, but includes also some specimens from the White Mountains and western Massachusetts. Large collections have been made of the *Gramineae*, *Cyperaceae*, and vascular cryptogams, while the genera *Aster*, *Solidago*, and *Prunus* are well represented. This collection, of perhaps 2000 specimens, contains mosses as well as phaenogams and ferns.

**Gray, Asa**, see Harvard University, Gray Herbarium.

**Green, Arnold**, PROVIDENCE, RHODE ISLAND. — For the last thirty years Mr. Green has collected plants in the vicinity of his home, and his herbarium, which contains about 1500 sheets including about 1200 species, is mostly local.

**Greene, Benjamin D.**, see Boston Society of Natural History.

**Grout, Abel Joel**, BROOKLYN, NEW YORK. — Mr. Grout's herbarium contains about 1500 sheets of Vermont phaenogams, 700 species of Vermont fungi, and 250 species of New England mosses. His collection is especially rich in Vermont asters.

**Harger, Edgar Burton**, OXFORD, CONNECTICUT. — In 1878 Mr. Harger and the late John Harger, his father, began a collection of plants which has steadily increased until it now contains about 1650 species, represented by 2900 sheets, of flowering plants and ferns, and about 350 species, or 400 sheets, of the lower cryptogams. Nearly 75 per cent of these plants have been collected by Mr. Harger, who has made an attempt to represent as completely as possible the flora of Connecticut, and especially that of the town of Oxford.

**Harvard University, Arnold Arboretum**, JAMAICA PLAIN,

MASSACHUSETTS.—The earliest portion of this collection dates back to 1878 when a few specimens of woody plants were organized as a herbarium. In 1882 it had grown to 6000 or 8000 sheets and August 1, 1900, it numbered 34513 sheets. It consists of specimens of trees and shrubs from all parts of the world, and is specially rich in *Coniferae*. An excellent library of 7300 volumes is connected with it. Professor Charles Sprague Sargent has the direction of this herbarium.

**Harvard University, Botanical Museum, CAMBRIDGE, MASSACHUSETTS.**—The herbarium at the Botanical Museum is a working collection for classes in Botany at Harvard College. It contains phaenogams and vascular cryptogams arranged in the order of Engler & Prantl's *Natürlicher Pflanzenfamilien*. It comprises about 10000 sheets of which about 1000 are Japanese, 1500 European, and 7500 are American. This collection is in charge of Professor George Lincoln Goodale.

**Harvard University, Cryptogamic Herbarium, CAMBRIDGE, MASSACHUSETTS.**—The Cryptogamic Herbarium of Harvard University contains the collection of fungi of the late Rev. M. A. Curtis and other valuable collections of fungi and is especially rich in published series of *fungi exsiccati*. The most important representation of lichens is the collection of Professor Edward Tuckerman which was purchased in 1888; other valuable sets of lichens are those of Mr. C. J. Sprague, Professor J. Mueller, and Professor Farlow.

The *Algae* of this herbarium are of wide geographic range—the most extensive set being presented by Dr. C. L. Anderson of Santa Cruz, Cal. Among the exotic species are the sets of Professor G. J. Agardh, Prof. J. E. Areschoug, Mr. E. A. Batters, Dr. Ed. Bornet, Professor C. Flahault, Dr. M. Foslie, Professor E. M. Holmes, F. Hauck, Dr. P. Hennings, Professor F. J. Kjellman, M. A. Le Jolis, Baron F. von Mueller, Maj. T. Reinbold, Professor J. Reinke, Dr. L. K. Rosenvinge, Madam Weber van Bosse, Professor E. P. Wright, and others.

The *Musci* are represented by the herbarium of Mr. W. S. Sullivant, the large collection of Mr. Thomas P. James, and the collection of Mr. Thomas Taylor, all of which have been recently transferred to the Cryptogamic Herbarium from the Gray Herbarium.

An accurate count of the cryptogamic herbarium has never been made but a conservative estimate would place the number of speci-



mens at several hundred thousand. Professor William Gilson Farlow has the care of this herbarium.

**Harvard University, Gray Herbarium, CAMBRIDGE MASSACHUSETTS.** — Early in his botanical work, about 1835, Dr. Gray began his herbarium and its development remained through the rest of his life one of his chief aims. His own collecting was largely done in the lake-region of western central New York, the southern Alleghanies, the central Rocky Mountains, Mexico, and California. While the plants thus secured are numerous, they form but a very small part of his herbarium. Associated with Dr. John Torrey from 1838 to 1843 in the preparation of the *Flora of North America*, Dr. Gray received duplicate types of nearly all the plants therein described. Soon after began the notable series of trans-continental surveys which opened up the vast region of the Great West. During this epoch extending from Frémont's Expedition in 1842 to the Natural History Survey of California (the botanical results of which were published in 1876-1880) Dr. Gray's eminence in American botany attracted to him an extraordinary wealth of botanical material from all regions which were being explored. The collections of the Pacific Exploring Expedition, of Charles Wright in Texas, New Mexico, Arizona, Cuba, and Nicaragua, of August Fendler in New Mexico, Venezuela, and Trinidad, of Dr. George Thurber on the Mexican boundary, of Messrs. Brewer, Bolander, and others in California, of Dr. Sereno Watson in the Great Basin, and of Dr. Rothrock in Arizona, merit particular mention on account of their size and importance. Dr. Gray also stood, almost from the beginning of his botanical work, in intimate exchange relations with the leading botanists of Europe, especially England, and derived from this source many extensive additions to his herbarium.

In 1864 Dr. Gray presented his herbarium and valuable library to Harvard College and it was then installed in the building which it now occupies and which had been constructed for it through the liberality of Nathaniel Thayer, Esq. At that time Dr. Gray estimated that it contained 200000 specimens, including both phanogams and cryptogams. From the early seventies until the end of his life Dr. Gray was engaged in the preparation of the *Synoptical Flora*, and one source of the great value of the Gray Herbarium arises from the fact that so many of its specimens were critically examined and labeled during the progress of this work. Next in

importance to Dr. Gray's monographic work upon the flora of North America were his studies of the Mexican flora upon the basis of the rich collections of Xantus, Ervendberg, Gregg, Wright, Schaffner, Parry, Palmer, and Pringle, and very full sets of the plants secured by these collectors are to be found in the Gray Herbarium.

In 1870 Dr. Sereno Watson, who had been engaged at the Gray Herbarium in the identification of the extensive material from the Clarence King Exploration of the 40th parallel, was made Assistant, and later (in 1880) Curator of the Herbarium, Dr. Gray still holding the directorship until his death in 1888. After the death of Dr. Watson in 1892, Dr. B. L. Robinson, the present curator was appointed. The staff now includes, besides the curator, two assistants, a collector, and a librarian. The bryophytes and thallophytes have been transferred to the Cryptogamic Herbarium of Harvard University, and the Gray Herbarium, thus restricted to the phaenogams and pteridophytes includes at present 320000 sheets holding from 1 to 5 specimens each, and representing the vegetation of all lands. The usual rate of increase is from 10000 to 14000 sheets annually. Among the most noteworthy collections which have been partially or entirely incorporated in the Gray Herbarium are the herbaria of Jacques Gay, G. Curling Joad, John Ball (all rich in European plants); the herbarium of William Boott (containing a wealth of New England material chiefly from the suburbs of Boston, the White Mountains, and Vermont, also an extensive collection of *Carices* from both continents); the herbarium of Dr. George Thurber (noteworthy for its numerous critically examined grasses, as well as many plants of Rhode Island and northwestern Mexico), and the *Compositae* from the herbarium of Dr. F. W. Klatt, of Hamburg, specialist in that group.

The Gray Herbarium is arranged according to Engler & Prantl's *Natürlichen Pflanzenfamilien* and is open on week-days from 9 A. M. until 5 P. M. except Saturday afternoons. The library contains 12000 volumes and pamphlets. Except for the botanical serials, of which it contains a very full representation, it is nearly restricted to systematic works relating to the phaenogams and pteridophytes and is in its field very complete.

(*To be continued.*)

*Vol. 3, No. 32, including pages 209 to 222 and plate 34, was issued 9 August, 1901.*

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Almost immediately upon leaving Oldtown, the home of the Penobscot Indians, one feels that he is in the woods, and every minute of the ride will make him impatient to stop the train for the tantalizing plants which flash by in the clearings or by the streams. In fact, the true botanist will inevitably moralize to himself on the desirability of through vestibuled trains and parlor cars, and he may decide to take the freight train at the next station.

If he has spent hours about home searching for something really new to him, he will start with delight as he sees the fields and banks of blue *Aster Lindleyanus* just above Oldtown, or the clearings crimson in September with the drooping tassels of *Polygonum Careyi*. Or, if he is fortunate enough to get off in May, he will be greeted from recent clearings by fragrant white masses of Sweet Coltsfoot, *Petasites*.

Just beyond Alton, he cannot help longing to explore the indefinite miles of Sphagnum swamp, and if he looks to the West, he will see a beautiful little round pond bordered by gnarled Black Spruces, which he instantly knows must be covered with the tiny Mistletoe, *Arceuthobium pusillum*. Alton bog is well worth exploring, but it is only a small area compared with the hundreds of miles of such country through North-central Maine, and unless one has plenty of time he should save that and his enthusiasm for "farthest north."

If one is bound for Moosehead Lake he will follow the Piscataquis River, where, along the banks, or in the neighboring woods and swamps, he will find at different seasons many good things, among them *Anemone riparia*, *Epilobium palustre*, *Erigeron hyssopifolius*, *Antennaria petaloidea*, *Senecio Balsamitae*, *Vaccinium caespitosum*, *Pyrola asarifolia*, *Primula mistassinica*, *Calypso*, *Allium Schoenoprasum*, *Carex deflexa* and *Lycopodium sabinaefolium*.

If he wants the rare **CALAMAGROSTIS NEMORALIS** he should visit the Chocorua-like peak of Boarstone Mt., on Lake Onawa (reached from Monson).

When he reaches Moosehead and Mt. Kineo he will naturally want to

## BANGOR AND AROOSTOOK RAILROAD.

get **CAREX PORTERI**, *C. saxatilis*, var. *miliaris*, and *C. Grahami* from the gravelly shores or low woods; and on Kineo he will look for *Draba incana*, var. *arabisans*, *Primula farinosa*, *Shepherdia canadensis*, *Carex capillaris*, and *Aspidium fragrans*.

In the Katahdin Iron Works region, too, the botanist will be very happy, but the great botanizing begins as he approaches southern Aroostook County. From the main line of the railroad beyond the Katahdin Iron Works district one has some splendid views of Mt. Katahdin itself with the neighboring masses of Sordnahunk and Traveller Mts. If one does not make up his mind at once to explore the giant amphitheatres and castellated ridges of Katahdin, he is no true lover of the best of botanical exploring and of inspiring mountain life. (For detailed account of Katahdin and its flora, as far as known, see RHODORA for June, 1901.)

At Crystal flag-station one should stop long enough to explore a bit of the great bog which furnishes the upper waters of Molunkus Stream. Following the railroad back half a mile he will find himself surrounded by masses of *Betula pumila*, *Lonicera oblongifolia*, and other northern shrubs, with an herbaceous flora including *Parnassia caroliniana*, **DRO-SERA LINEARIS**, *Valeriana sylvatica*, *Aster junceus*, *Pyrola rotundifolia*, var. *uliginosa*, *Toxifolia glutinosa*, *Carex chordorhiza* and *C. livida*.

If he wishes to stop for some time in the region (and who does not) he can have good accommodations at Island Falls; and there, near the Mattawamkeag River, he will get the local **ANTENNARIA RUPICOLA**, *Hieracium vulgatum*, *Erigeron acris*, and *Halenia deflexa*. In the river, itself, and in Mattawamkeag Lake he will revel in September, dragging up such prizes as *Myriophyllum Farwellii*, *M. alterniflorum*, and *Potamogeton obtusifolius*.

When Houlton is reached one should make up his mind to stop at some of the numerous villages between there and the Aroostook River, for the Cedar (*Arbor-vitae*) swamps of the Meduxnakeag and the Presque Isle valleys are the homes of *Cypripedium spectabile*, *Microstylis monophyllos*, *Carex vaginata*, and scores of other species of absorbing interest.

The valleys of the Aroostook and the main St. John—for instance at Fort Fairfield, Van Buren, Fort Kent, and St. Francis—furnish one of the most striking floras of New England. There among other species one will get **THALICTRUM CONFINE** and **T. OCCIDENTALE**, **OXY-TROPIS CAMPESTRIS**, var. **JOHANNENSIS**, *Hedysarum boreale*, **TANACETUM HURONENSE**, **PRENANTHES RACEMOSA** and **P. MAINENSIS**, *Gentiana Amarella*, var. *acuta*, **PEDICULARIS FURBISHIAE**, **SALIX GLAUCOPHYLLA** and **S. ADENOPHYLLA**, **GOODYERA MENZIESII**, *Juncus alpinus*, var. *insignis* and **J. TENUIS**, var. **WILLIAMSII**, *Triglochin palustre*, *Scirpus Clintonii*, **CAREX CRAWEI** and **C. BICOLOR**, *Equisetum palustre* and *E. variegatum*, and *Lycopodium sitchense*.

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